

WHAT IS CLAIMED IS:

1. Method for the sending of a signal formed by vectors, each vector comprising N source symbols to be sent, and implementing M transmit antennas where M is greater than or equal to 2,
 5 characterized in that a linear precoding is performed on said signal, implementing a matrix product of a source matrix, formed by said vectors organized in successive rows, by a linear precoding matrix, delivering a precoded matrix, and in that precoded vectors corresponding to columns of said precoded matrix
 10 are sent successively, the M symbols of each precoded vector being distributed over said M antennas.
2. Sending method according to claim 1, characterized in that said precoding matrix is a block matrix.
3. Sending method according to any one of the claims 1 and 2, characterized
 15 in that said precoding matrix is a unitary matrix having a size greater than or equal to M.
4. Sending method according to any of the claims 1 to 3, characterized in that said precoding matrix has the form:

$$\begin{aligned}
 \Theta_L &= \sqrt{\frac{2}{L}} \cdot \begin{bmatrix} \Theta_{L/2} & \Theta_{L/2} \\ \Theta_{L/2} & -\Theta_{L/2} \end{bmatrix}^T \\
 \text{with } \Theta_2 &= \begin{bmatrix} e^{i\theta_1} \cos \eta & e^{i\theta_2} \sin \eta \\ -e^{-i\theta_2} \sin \eta & e^{-i\theta_1} \cos \eta \end{bmatrix} \\
 \text{and } \eta &= \frac{\pi}{4} + k \frac{\pi}{2}, \theta_2 = \theta_1 - \frac{\pi}{2}, \text{ and for } i \in [1, 2], \theta_i = \frac{\pi}{4} + k' \frac{\pi}{2} \text{ where } k, k' \text{ are} \\
 &\text{relative integers.}
 \end{aligned}$$

5. Method for the reception of a signal sent on M transmit antennas where M
 25 is greater than or equal to 2, implementing P receiver antennas, where P greater than or equal to 2,
 characterized in that reception vectors are received on said P antennas and are distributed by columns in a reception matrix, the P symbols of a reception vector

being distributed on said P antennas,

and in that it implements a processing of said reception matrix, comprising a step of multiplication by a linear de-precoding matrix representing a linear precoding matrix used at sending,

5 so as to obtain a de-precoded matrix by which it is possible to extract an estimation of the source symbols sent.

6. Reception method according to claim 5, characterized in that said de-precoding matrix is the conjugate transpose matrix of said precoding matrix.

7. Reception method according to claim 6 characterized in that, said sent
10 signal being conveyed between said M transmit antennas and said P receiver antennas by a transmission channel, said reception matrix is multiplied, during said processing operation, by a matrix representing the inverse of said transmission channel, so as to obtain a matrix of estimated symbols sent, and in that said matrix of estimated symbols sent is then multiplied by the de-precoding matrix.
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8. Reception method according to any of the claims 6 and 7, characterized in that it comprises a preliminary step of detection of said M transmit antennas implementing a successive cancellation algorithm.

9. Reception method according to claim 5 characterized in that, said sent
20 signal being conveyed between said M transmit antennas and said P receiver antennas by a transmission channel, said de-precoding matrix is an inverse matrix of a total matrix associating the matrix of said channel and said linear precoding matrix.

10. Reception method according to claim 9, characterized in that said de-precoding matrix is determined by implementation of a Cholesky decomposition algorithm.
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11. Signal formed by vectors sent successively on M transmit antennas, where M is greater than or equal to 2, the M symbols of each vector being distributed on said M antennas,

30 characterized in that said vectors are precoded vectors corresponding to columns

of a precoded matrix obtained by a matrix product of a linear precoding matrix and a source matrix, formed by source vectors each comprising N source symbols to be sent, said source vectors being organized in said source matrix in successive rows.

- 5 **12.** Device for sending a signal formed by vectors each comprising N source symbols to be sent, and implementing M transmit antennas, where M is greater than or equal to 2,
- characterized in that it comprises means of linear precoding of said signal, implementing a matrix product of a source matrix, formed by said vectors
- 10 organized in successive rows, by a linear precoding matrix, delivering a precoded matrix,
- and means for successively sending precoded vectors corresponding to columns of said precoded matrix, the M symbols of each precoded vector being distributed over said M antennas.
- 15 **13.** Device for the reception of a signal sent on M transmit antennas, where M is greater than or equal to 2, said device comprising P receiver antennas, where P is greater than or equal to 2,
- characterized in that it comprises means of reception, on said P antennas, of reception vectors, and means of distribution by columns of said reception vectors
- 20 in a reception matrix, the P symbols of a reception vector being distributed on said P antennas,
- and in that it comprises means of processing of said reception matrix, comprising means of multiplying by a linear de-precoding matrix representing a linear precoding matrix used at sending,
- 25 so as to obtain a de-precoded matrix by which it is possible to extract an estimation of the source symbols sent.